FOREST ANALYSIS BRANCH

Harvest Flow Considerations for the Timber Supply Review

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Harvest Flow Considerations for the Timber Supply Review

Introduction

This discussion paper provides information additional to the *Supplemental Guide for Preparing Timber Supply Analysis Data Packages*. The document describes essential harvest flow considerations which the chief forester reviews during allowable annual cut (AAC) determinations[1]. The information will be useful to licensees, timber supply analysts, resource agency staff and other stakeholders involved in the provincial Timber Supply Review (TSR) process.

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. Defining the harvest flow to be applied in the base case forecast for a timber supply analysis frequently involves an examination of the interactions of possible harvest levels in the short, medium and long term. Most often, there is no exclusive choice of harvest flow; rather, the choice of harvest flow usually reflects an attempt to balance the many considerations.

This document is not intended to be a comprehensive guide for establishing harvest flows in timber supply analysis. Rather, it is intended to describe key modelling considerations as well as generate dialogue and discussion within the provincial forest analysis community. Comments on the working paper are welcome and should be submitted to:

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1 In B.C. AACs are typically determined using volume-based criteria. However, area-based approaches offer an alternative for establishing and regulating harvest levels. Although not discussed in this paper, the underlying principle is that area-based AACs are established using an even-flow projection of area available for harvest, thereby simplifying harvest flow considerations.

1. Elements of harvest flow

Figure 1 shows the principal elements of a timber harvest forecast. In most cases harvest flow is characterized by some initial harvest level followed by a managed transition to a long-term harvest level (LTHL). The LTHL is the harvest level that can be maintained indefinitely given a specified timber harvesting land base and associated management regime. The long run sustainable yield (LRSY) is a theoretical estimate of the maximum volume of wood that could be harvested in perpetuity. It is a measure of the maximum biological capacity of the timber harvesting land base (THLB). The LTHL is always considerably less than the LRSY, which does not consider non-timber values or other management objectives.

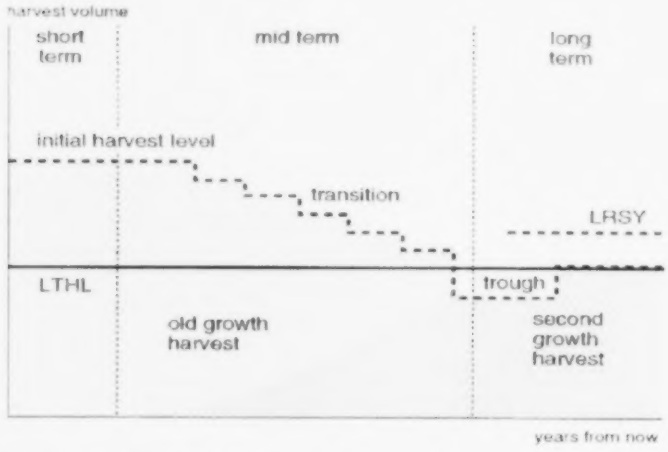

Figure 1. Elements of a harvest flow graph.

Timber supply is usually considered within the context of three relative timeframes — short term, medium term and long term. The short term is typically represented by the first two decades of the harvest forecast and reflects the period in which the scheduled harvest level is defined by immediate concerns of achieving socio-economic objectives and maintaining non-timber values. The medium term corresponds to the transition from harvesting mostly old growth to harvesting managed stands. The long term is the period that begins approximately when the harvest reaches the LTHL.

Guidance in developing harvest flow objectives is taken from the current economic and social objectives of the Crown expressed by the Minister of Forests in a letter to the chief forester in 1994. In the letter, the Minister emphasized the importance of the continued availability of good forest jobs and the long-term stability of communities that rely on forests. The letter also states that any decreases in allowable cut at that time should be no larger than necessary to avoid compromising long-run sustainability.

In general, a reasonable flow pattern provides for a managed and gradual transition from short-term to medium- and long-term harvest levels, and avoids large and abrupt disruptions in timber supply. A reasonable flow has a medium-term level that drops below the long-term level to the minimum extent and only if justified. The long-term level should provide an even level of growing stock over the long term.

2. Transition from short to long term

With respect to the short term (first 20 years of the forecast), a common reference point is the current AAC. This level, adjusted upward or downward to account for appropriate deletions or additions (e.g., woodlot licences, community forest agreements, or land transfers) since the last AAC determination, is the most frequent starting level for a base case forecast. Commonly, the base case forecast is defined by projecting the current AAC for as long as possible while allowing for a stable harvest forecast with gradual declines over the medium term, to a stable level in the long term.

For the medium-term level, key considerations include the following:

- A medium-term harvest level below the long-term harvest level should be avoided and if present, minimized. For example, in Figure 2 below, the harvest forecast in bold is preferred over the two alternatives.

Figure 2. Hypothetical harvest forecasts showing various levels of medium-term timber supply.

- If there is a decline in the base case forecast, one or more alternative harvest forecasts should demonstrate the impact of not reducing the short-term harvest target (that is, when a disruption in the forecast occurs).
- Under conditions when land base, growth and yield and management inputs do not change substantially between consecutive TSR analyses, the medium-term level should not drop below that of the previous TSR analysis. The main consideration is that short-term timber supply should not be increased at the expense of lowering the medium-term level.

Figure 3 shows a hypothetical example in which the harvest forecast in a previous TSR projected one decade at a harvest level above the long-term level, followed by a decline to the LTHL. In this example, the forecast for the current TSR is shown as maintaining the same initial level as the previous TSR, but with a lower medium-term level. However, based on the previous TSR, the expectation would be that the harvest forecast for the current analysis would be at, or at least closer to, the LTHL. Based on these forecasts, it appears as if the higher short-term level forecast for the current TSR has been achieved by decreasing the medium-term level.

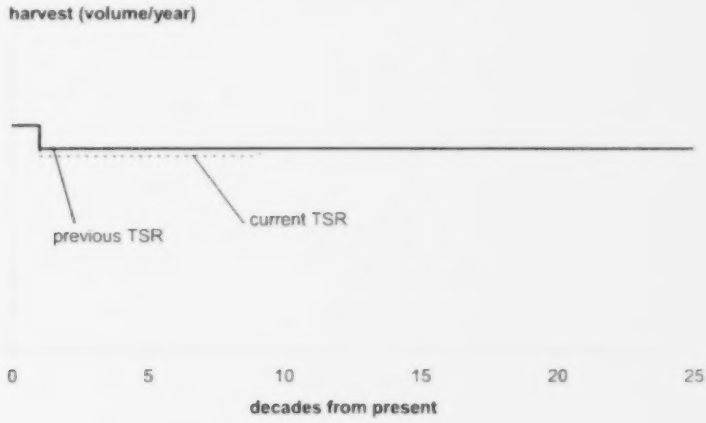

Figure 3. Comparison of hypothetical harvest forecasts from consecutive timber supply reviews.

3. Stable or fluctuating harvest forecasts

Stable harvest forecasts are preferred over fluctuating forecasts.

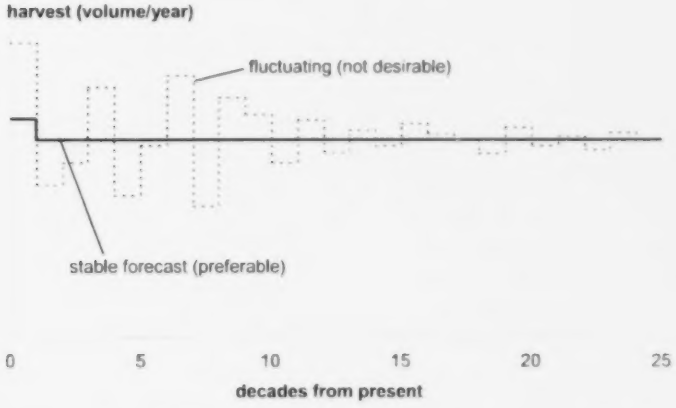

Figure 4. Hypothetical harvest forecasts showing the difference between stable and highly variable timber supply forecasts.

In contrast to a highly fluctuating forecast, an even-flow forecast provides for more stability. In addition, even-flow harvest forecasts may be more straightforward to link with sustainability objectives than declining forecasts. However, a flat-line harvest forecast often hides timber supply dynamics by making it difficult to determine if the existing growing stock or the productivity of the land base is limiting the harvest level. If an even-flow harvest flow is used in the base case and associated sensitivity analyses, a discussion of underlying timber supply dynamics and their role in defining the forecast should be provided in the analysis report.

4. Allowable annual cut increases

Harvest forecasts for many management units in B.C. show declining timber supply over a period of decades. The general approach in cases of declining timber supply is not to increase short-term allowable annual cuts unless there are compelling reasons to do so. The preference has been to employ any potential increases in supply to mitigate the need for future reductions rather than to increase short-term harvests. This approach minimizes the likelihood that an increase in allowable annual cut will lead to the need for larger future reductions and consequent socioeconomic adjustments. A factor that may justify a potential increase even though the harvest forecast is declining is the risk of loss of stands to fire, insects or disease due to current or developing stand attributes.

5. Developing a base case

Establishing appropriate initial, medium and long-term harvest levels in TSR timber supply analyses typically includes the following steps:

- Determine the maximum long-term harvest level;
- Assign the initial harvest level as close to the current AAC (adjusted to account for new or expanded woodlots, community forest agreements or land transfers) and maintain the harvest level for as long as possible;
- If the initial harvest level is greater than the long-term harvest level, determine a suitable rate of decline (i.e., 10 percent or less per decade);
- During the transition, avoid dropping below the maximum long-term harvest level if possible;
- If the initial harvest level is greater than the current AAC, then the harvest forecast should be depicted as an even-flow at that initial level.

In summary, timber supply analysis including a detailed examination of harvest flow helps decision-makers evaluate the impacts of alternative harvest flow policies on the choice of initial harvest level. A knowledge of the underlying assumptions about harvest flow, the associated interactions and the timber supply dynamics of the management unit is essential to enable sound interpretation of timber supply analyses and support the TSR process. Licensees are encouraged to review previous TSA analyses and AAC rationales to gain a better understanding of harvest flow patterns currently considered by the chief forester in making AAC determinations.